

What is claimed is:

1. A method for diagnosing mastitis of cows, comprising the steps of irradiating visual light rays and/or near infrared rays in a wavelength range of 400 to 2500 nm into urine, raw milk or a mammary gland of a cow, detecting an intensity of transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland, effecting multivariate analysis by using a classification model based on probability, separability or similarity, and diagnosing the presence of the mastitis of the cow.

2. A method for diagnosing mastitis of cows set forth in claim 1, comprising the steps of irradiating near infrared rays in a wavelength range of 700 nm to 2500 nm into urine, raw milk or a mammary gland of a cow, detecting an intensity of transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland, effecting multivariate analysis by using a classification model based on probability, separability or similarity, and diagnosing the presence of the mastitis of the cow.

3. A method for diagnosing mastitis of cows, comprising the steps of irradiating near infrared rays in a wavelength range of 700 nm to 1100 nm or 1100 nm to 2500 nm into urine, raw milk or a mammary gland of a cow, detecting an intensity of transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland, effecting multivariate analysis by using a classification model based on probability, separability or similarity, and diagnosing the presence of the mastitis of the cow.

4. The cow mastitis-diagnosing method set forth in any of claims 1 to 3, which comprising scanning wavelengths of incident rays, transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland, and applying the multivariate analysis to the thus obtained spectra of the visual light rays and/or the near infrared rays by using the classification model based on the probability, separability or similarity.

5. The cow mastitis-diagnosing method set forth in any of claims 1

to 4, wherein the multivariate analysis is effected of the visual light rays and/or the near infrared rays by using the classification model based on the probability, separability or similarity according to a SIMCA method.

6. An apparatus for diagnosing mastitis of cows, comprising:

~~a near infrared ray generator for generating visual light rays and/or~~
near infrared rays in a wavelength range of 400 to 2500 nm;

an optical system for introducing the visual light rays and/or near infrared rays into urine, raw milk or a mammary gland of a cow;

a detector for detecting an intensity of transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland;

and a data processor for receiving signals from said detector, and effecting multivariate analysis by using a classification model based on probability, separability or similarity to diagnose the presence of the mastitis of the cow.

7. The cow mastitis-diagnosing apparatus set forth in claim 6, wherein said near infrared ray generator is an infrared ray generator for generating a near infrared rays in a wavelength range of 700 to 2500 nm, an infrared ray generator for generating a near infrared rays in a wavelength range of 700 to 1100 nm, or an infrared ray generator for generating a near infrared rays in a wavelength range of 1100 to 2500 nm.

8. The cow mastitis-diagnosing apparatus set forth in claim 6 or 7, which further comprises an optical fiber from said near infrared ray generator for introducing the visual light rays and/or near infrared rays into said urine, raw milk or a mammary gland of the cow, and transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland is led to said detector through the optical fiber.

9. The cow mastitis-diagnosing apparatus set forth in any of claims 6 to 8, which further comprises a feeder for introducing said raw milk into a sample container via an on-line or at line.

10. The cow mastitis-diagnosing apparatus set forth in any of claims 6 to 9, which further comprises a sample container for holding the raw milk,

and a temperature controller for stabilizing the milk inside the sample container to a given temperature.

11. The cow mastitis-diagnosing apparatus set forth in any of claims 6 too 10, wherein the multivariate analysis is effected of the visual light rays and/or the near-infrared rays by using the classification model based on the probability, separability or similarity according to a SIMCA method.

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A1

Added B3